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ABSTRACT

"Imbedded Aids to Readers" is a theoretical component of the "Languaging in the Content Areas" (LICA) thesis, which emphasizes that understanding the uses of language and increasing language practice will improve content reading and critical thinking ability. The imbedded aids are clusters of vocabulary and attention-heightening devices, content mastery techniques, and reading/thinking/evaluating skills. Specific aids within these clusters include summary outlines, rereading directions, numbering main lines of texts for easy reference, and providing notes about vocabulary, reading aids, and memory aids in text margins. During an eight-day investigation, 50 seventh-graders in two science classes were pretested for reading ability, and one class studied a science chapter using the imbedded aids while the other class studied the chapter without the imbedded aids. Although posttest results did not show that imbedded aids significantly improved comprehension for all levels of readers, the concept of imbedding reading aids directly into a text seems to remain a valid concern that deserves further investigation. (RL)

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An Investigation into the Effects of "Imbedded Aids"

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AN INVESTIGATION INTO THE EFFECTS OF IMBEDDED AIDS

The American educational system operates on the assumption that the textbook is a sound and adequate source from which students can expect to learn. The data of a multitude of studies have failed to support this assumption. Reading surveys indicate that the range of differences in reading comprehension increases with progress through school (Smith, 1965). Consequently, publishers have attempted to reach lower range achievers by "gearing down" textbooks to conform to certain predetermined readibility levels. Additionally, efforts have been made to alter types and size of print, number of pictures, and quality of paper to make books "more readable". Even the most stringent vocabulary controls, however, do not seem to adequately remove obstacles to word-recognition and comprehension. Many readers are still caught up in a "cumulative deficit" syndrome: falling further behind skill and knowledge requirements with each passing year. Penty (1956) found in interviews with poor readers, a growing negativism toward their textbooks, with feelings of hostility and defeat generalizing to the courses in which textbooks were a central feature.

Shepherd (1973) states that good readers as well have difficulty coping with textbook reading assignments: they tend to read print without any active involvement. The habits of inquiry, discovery, and problem-solving have in common the fact that each require the student to think. Thinking thus entails effort, activity, and involvement on the part of the student. One factor that determines the type and level of thinking used is the material. Many textbooks, however, seem to contain a dearth of motivational assistance designed to enhance these types of thinking. The problem would thus seem to be that most students fail to learn, not because they are offered too much information, but because they are not provided with enough (Manzo and Sherk, 1977).

This study delineates a new approach to textbook reading which attempts to correct such incongruities by altering aspects of the print tradition. This is achieved through use of an innovation called "Imbedded Aids To Readers" (Manzo, 1976, Meeks, 1977).

Imbedded Aids As A Component of the LICA Thesis

Imbedded Aids are defined as units of assistance and enrichment which are woven into the fabric of a textual material so as to be unobtrusive, and yet present and available for reader use. They are a component of a theoretical structure being suggested as a unifying thesis of post-elementary reading-programming called "Languaging in the Content Area" or the LICA Thesis. A key precept of the LICA Thesis is emphasis on the use of language as it influences the quality of thought. Within this framework, it is felt that"Imbedded Aids" would contribute to a creation of a dynamic tension between the reader and the author's word on the printed page. Students would thus be able to interact with

print, not just be a captive and/or passive recipient of information. There would be opportunity to critically examine textbook material in order to develop personal or acquired concepts from which to extend knowledge. Additionally, "Imbedded Aids" would provide immediate help with reading and study skills across ability levels in that students choose those Aids which are most valuable for their particular needs. In this way, "Imbedded Aids" address themselves to the diverse range of student abilities by effectively broadening the readability range, both downward by removing verbal obstacles, and providing summaries and outlines of material, and upward through analytical and critical thinking exercises, and the incorporation of attention-heightening devices within passages. Thus, students would not only internalize newly discovered knowledge, but as a result of new information gained, engage in languaging relative to the individual and skill efficiency.

A major purpose of this study was to examine reading level and the effect of "Imbedded Aids" upon comprehension of textbook material. The results also indirectly reflect on the LICA Thesis. To this extent, this study is further exploration of this formulating thesis as well. Data were collected for the purpose of answering these research questions:

1. Do Imbedded Aids improve short-term comprehension for low, medium and high readers?
2. Do Imbedded Aids improve long-term comprehension for low, medium and high readers?

Specific experimenter-designed Aids were divided into clusters related to 1) Vocabulary and Attention-Heightening Devices 2) Content Mastery Techniques, 3) Reading/Thinking/Evaluating skills, and were respectively embedded into the first reading selections of a science textbook chapter from Life: It's Forms and Changes, (Brandewin, 1972). The final selection contained a sample of all previously utilized Aids. Specific Aids within each cluster included the following:

Cluster I: Vocabulary and Attention-Heightening Devices

1. Numbering of main lines of text for easy reference. This specific Aid was common to each cluster.

2. Vocabulary defined in left-hand margin. Terminology consisted of scientific terms as well as those felt to be unfamiliar in standard usage.

3. Unusual word derivations and pronunciations. Specific etiologies, meanings of prefixes, and root words were discussed.

4. Division of words into syllables with pronunciation keys.

5. Reader Helper Notes. These notes further extended existing material from the text, reinforced concepts presented, and raised relevant questions. They were presented as a supplementary sheet to the reading selection.

6. Memory Helper Notes. Memonic devices and hints for remembering difficult words or facts were provided on a separate sheet.

7. Vocabulary Checks. Exercises were inserted within the text so that a student might check his own progress in learning of word meanings. The number of the line which contained the specific word in context was included.

Cluster II: Content Mastery Techniques

1. Numbering of main lines of text for easy reference.

2. Reader Helper Notes.

3. Memory Helper Notes.

4. Mini-notes in margins. An arrow pointed from the context to the mini-note signaling reference to specific portions of the text. These notes informed the reader of the importance of the passage, need for concentrated study or denoted special directions.

5. To the Reader. Directions placed at logical beginnings of topics asked the reader to refer to graphs, gave an overview of the selection, or denoted special directions.

6. Summary Outlines. Outlines of a passage were presented in concise, sequential summary statements.

7. Re-reading Directions. Subjects were instructed to skim particular passages and re-read those felt to be especially important.

8. Comprehension Checks. True/False questions, cloze-type exercises, and response questions were inserted throughout the reading selection. Each exercise was referenced with the appropriate line number to enable the reader to check the accuracy of his/her response with the text.

Cluster III. Reading/Thinking/Evaluating Skills

1. Numbering of Main Lines of Text for Easy Reference.

2. Rating of Importance of Facts. Parenthesis were placed at the end of each fact in the text. Students were instructed to rate the importance of each fact on a 1(high) 5 (low) scale. The rating of 1 indicated that the subject perceived that fact as very important; the rating of 5 indicated that the fact was virtually unimportant. Students were to compare their rating to a similar rating of each fact placed in the margin by the author. If a wide difference between the two ratings occur students were instructed to re-read the paragraph and re-evaluate the importance of that fact.

3. Rating of Understanding of Facts. Each cluster of facts was enclosed in brackets. Within the parenthesis placed beside the bracket, subjects were asked to indicate their understanding of that cluster on a 1 (high) to 5 (low) scale. The rating of "1" would indicate complete understanding and "5" would indicate no understanding. Subjects were told that when understanding fell below a "2" rating, they were to seek help from the instructor.

4. Make a Prediction. Based on facts read in the chapter, subjects were asked to predict answers to specific questions. After an answer was predicted, they were instructed to check appropriate lines of text to determine if their prediction was correct.

5. Re-reading Directions.

METHOD

Subjects for the study were fifty randomly selected seventh graders from a suburban mid-western public school. These fifty students were randomly assigned to two science classes. One class served as an experimental group; the other as a control group. There were 25 subjects in each group. Both groups met daily for a period of fifty-five minutes during the course of the eight day investigation. The investigator served as instructor for both groups.

On the initial day of the study, all subjects were administered a Cloze passage test. The subjects were divided into lower, middle and upper third of reading ability according to the results of this test. This division resulted in the following ranges according to subjects scores of percentage right; High-62% to 38%; Medium-36-28%; Low 26-1%. The same cut-off score was used for both the experimental and control group.

Procedure

Subjects in the experimental group were told they would be reading a chapter from the science text with built-in reading Aids and activities. Directions on use of Aids were included with each day's reading assignments. Teacher instruction in use of Aids was also conducted.

The control group read the same material as the experimental group. In lieu of instruction detailing the use of Aids, a purpose for reading was discussed and new terminology was introduced, similar to the prereading activities characteristic of the Directed Reading Activity (Betts, 1946).

Data Analysis

In analyzing the data, a 2x3 analysis of variance was performed for each of the four clusters under both short-term and long-term conditions, making a total of eight analyses. The treatment condition was designated as one factor, and reading level as the second factor.

RESULTS

Short-term Comprehension

Relevant data were analyzed to determine whether "Imbedded Aids" improved short and long-term comprehension for low, medium, and high readers on each separate cluster test.

The short-term analyses on the four cluster tests revealed no statistically significant F ratios. An inspection of the mean percentage scores for low readers indicated that control group low readers had higher mean scores that those in the experimental group on three of four short-term comprehension cluster tests. Only on Cluster Test 4 was this trend reversed. A similar pattern was found in comparisons of scores for medium readers.

The experimental group high readers displayed consistently higher percentage scores than those in the control group on all four measures. The results were, however, not statistically significant.

Long-term Comprehension

On the long-term comprehension analyses, high readers in the experimental group again had higher mean scores than control, although not statistically significant. In comparison, a negative trend is evident for low and medium reader's success with comprehending Aid-related material on a long-term basis.

Implications and Recommendations

The assessment procedures used in this study did not support the effectiveness of the experimental materials for significantly imporving comprehension for low, medium, and high readers. Several factors are felt to have influenced the findings of this investigation.

First, the question of whether subjects actually used the Aids in the appropriate manner remains unanswered. The investigator believes that low readers simply read the Aids, but did not attempt to utilize them. Achievement is closely related to an individuals expectations about how well he might perform a task, expecially if the task is of intermediary difficulty (Feather-Atkinson, 1966). Thus, if students have experienced previous failures, the fear of failure motive is more intense than the achievement motive. The investigator can only speculate as to the relationship of motivation with the findings of this study. It would seem, however, that students who are "failure prone" would demonstrate avoidance behavior and take the path of least resistance, that of reading only the Aids and not the textbook passage.

Secondly, the effect of "Imbedded Aids" on the performance of high readers seems to be a positive one, although not a statistically significant one. This finding supports the investigatory belief that typical textbooks provide a dearth of motivational assiatance for high readers. It would seem that readability issues might for low and medium readers; however, the universal lowering of reading levels of texts could conceivably hinder the performance of high readers. One solution might be preparation of "Imbedded Aids" enrichment materials for high readers, those toward whom too little attention or concern seem to be directed.

A further point for study is the possible heuristic value of the Aids in stimulating student thinking and class discussion. The benefits accuring from these forms of stimulation may not be seen immediately, but are potentially a valid question to be answered by further research into the motivational aspects of "Imbedded Aids".

Finally, although the specific Aids designed for this study did not imporve comprehension for all levels of readers, the concept of embedding reading aids directly into a text seems to remain a valid concern for investigation. It will be necessary to ascertain by further experimentation which specific Aids are conducive to the promotion of maximum learning for learning for each level of reading ability. In addition, authors and publishers of textbooks need to become aware of the philosophical and empirical considerations that warranted the present investigation and thus begin exploration of alternative methods of development and presentation of prose-format within the textbook.

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